

14. The method of claim 12, wherein the islet transcription factor is a positive regulator of a neurogenin3 (Ngn3) regulatory pathway.

15. The method of claim 14, wherein the islet transcription factor is selected from the group consisting of HNF1, HNF3, and HNF6.

N.E.
16. The method of claim 12, wherein the islet transcription factor is a neuroendocrine bHLH transcription factor selected from the group consisting of a neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1, and mash2.

18. The method of claim 12, wherein the islet cells produced are beta cells.

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19. **(Amended)** A method for producing a mammalian islet cell *in vitro*, the method comprising the steps of:

introducing into a mammalian cell *in vitro* a nucleic acid molecule encoding an islet transcription factor, said introducing providing for expression of the islet transcription factor in the mammalian cell and production of the islet cell phenotype in the mammalian cell.

20. The method of claim 19, wherein the mammalian cell is a pancreatic cell.

21. The method of claim 19, wherein the islet transcription factor is neurogenin3.

N.E.
22. The method of claim 19, wherein the islet transcription factor is a positive regulator of a neurogenin3 (Ngn3) regulatory pathway.

23. The method of claim 19, wherein the islet transcription factor is a neuroendocrine bHLH transcription factor selected from the group consisting of a neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1, and mash2.

A³ 25. **(Amended)** A method for producing a mammalian islet cell *in vitro*, the method comprising the steps of:

introducing into a mammalian pancreatic cell *in vitro* a nucleic acid molecule encoding neurogenin3 (Ngn3), said introducing providing for expression of Ngn3 in the cell and production of the islet cell phenotype in the cell.

26. The method of claim 25, wherein the islet cell phenotype is that of a pancreatic beta cell.

N.E. 27. A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an islet cell produced by the method of claim 25 into a pancreas of a mammalian subject, said introducing providing for production of insulin by the islet cell and delivery of insulin to the bloodstream of the mammalian subject.

28. **(New)** A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an islet cell produced by the method of claim 12 into a pancreas of a mammalian subject, said introducing providing for production of insulin by the islet cell and delivery of insulin to the bloodstream of the mammalian subject.

A⁴ 29. **(New)** A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an islet cell produced by the method of claim 19 into a pancreas of a mammalian subject, said introducing providing for production of insulin by the islet cell and delivery of insulin to the bloodstream of the mammalian subject.

30. **(New)** The method of claim 12, where the precursor cell is an adult pancreatic cell.